

EPA reviews of Parcel B Trench Units that the Navy did not already recommend for resampling in the September 2017 draft Radiological Data Evaluation Findings Report																	
Overall score of 2 = Recommend resampling, 0 = no significant signs of concerns, and 1 = Needs further evaluation (1 was an interim score for tracking draft reviews. This is no longer to this final version of comments)																	
Please note: This review only includes the trench units that the Navy recommended as No Further Action/Evaluation in the September, 2017, draft Findings Report. Because the Navy already recommended the other trench units for resampling, EPA did not perform a similar detailed level of review for those.																	
Trench Unit	Overall score (0,1, or 2)	Box Plots	Q-Q Plots	Rounds of excavation	Gamma scan or static concerns	On vs offsite lab	Time Series	Suspect name (1=yes, 0=no)	Name, if suspect	Name, if not suspect	Signs of falsifying (1=Yes, 0=no)	Signs of falsification summary	Failure to follow workplan (1=Y, 0=N)	Signs of failure to follow workplan	Comments - Other	Followup needed, e.g. questions for Navy	See additional EPA statistical analysis
TU001	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	1) K-40 has some negative results and a different slope, Cs-137 negative results  2) FSS data sets for Ac-228, Bi-214, and K-40 indicate at least two different populations exist	1	1) Gamma static and scan results were not provided in the SUPR  2) Names of samplers/surveyors not provided in SUPR  3) 34 investigative samples are not in the SUPR or RACR	Onsite lab results biased high compared to offsite	1 FSS Bi-214 and 1 Ac-228 result at or below 0, 3 FSS K-40, several Cs-137 results below 0	0.5	Name(s) not provided	Name(s) not provided	1	1) No Confirmatory/biased samples were collected with FSS  2) K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2  3) Q Q Plots for FSS results for Ac-228, Bi-214, and K-40 depict at lead two different data populations	1	1) Gamma static and scan results were not provided in the SUPR 2) Gamma static and scan surveyor is not listed in the SUPR 3) 34 investigative samples are not in the SUPR or RACR	1) Significant data quality problems, indicated by the following:  K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted building 157	Navy should provide missing scan/gamma static data.	
TU002	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	Ac-228, Bi-214, K-40 RAS and K-40 FSS Bias results have a different slope than FSS; FSS Bi-214 has slope breaks indicating multiple populations. Form notes, "Final Systematic samples display characteristics of at least two different data populations for Bi-214"	2	1) Gamma static and scan results were not provided in the SUPR  2) Names of samplers/surveyors not provided in SUPR	Onsite Ra-226 results high compared to offsite	1 FSS Bi-214, 3 FSS Ac-228, several Characterization and Bias, several Cs-137 results below 0.	0.5	Name(s) not provided	Name(s) not provided	1	1) K-40 had second lowest mean results of any TU in Parcels B & D-2  2) Q Q Plots for FSS results for Bi-214 depict at lead two different data populations	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: K-40 had second lowest mean results of any TU in Parcels B & D-2 Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted building 157	Navy should provide missing scan/gamma static data.	
TU003	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	K-40 FSS has a different slope than other radionuclides FSS (includes negative values) and slope breaks indicating multiple populations	1	1) Gamma static and scan results were not provided in the SUPR  2) Names of samplers/surveyors not provided in SUPR	Inconsistent - offsite lab reported non detects for sample 1 and 5 for Ac-228; onsite lab reported results at 0.616 pCi/g and 0.215 pCi/g respectively.	None	0.5	Name(s) not provided	Name(s) not provided	1	1) 16 of 18 FSS sample results for Cs-137 were less than zero.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted building 140	Navy should provide missing scan/gamma static data.	
TU004	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	1) K-40 FSS has a different slope than other radionuclides FSS (includes negative values)  2) FSS results for indicate two different populations for Ac-228 and Bi-214. Form notes, "Final Systematic samples display characteristics of at least two different data populations for Ac-228"	1	1) Gamma static and scan results were not provided in the SUPR  2) 67 investigative samples results were not in the SUPR or RACR  3) Names of samplers/surveyors not provided in SUPR	Inconsistent - offsite lab data reported at levels lower than data reported from onsite lab.	1 Bi-214 FSS, 3 Ac-228 FSS, and 3 K-40 FSS results below 0. Several Cs-137 results below 0.	0.5	Name(s) not provided	Name(s) not provided	1	1) No Confirmatory/biased samples were collected with FSS  2) Investigative data (67 samples) not provided in RACR or SUPR  3) Q Q Plots for FSS results depict at lead two different data populations for Ac-228, K-40, and Bi-214	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 142	Navy should provide missing scan/gamma static data.	
TU005	2	K-40 in FSS appears to be from a different population than all other surveys. Cs-137 results all low, with multiple negative results - indicating a data quality issue	FSS Bi-214 and K-40 results indicate at least two populations	2	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Inconsistent - two elevated FSS results for Bi-214 are not comparable to Ra-226 reported results.	Two Bi-214 FSS results elevated compared to Ra-226 result reported.	0.5	Name(s) not provided	Name(s) not provided	1	1) Two Bi-214 FSS results elevated compared to Ra-226 result reported.  2) FSS results indicate at least two populations are present in Bi-214 data set.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0  2) Offsite lab mass not reported for 6PBF5-005-115  3) Two FSS samples have high Bi-214 outliers.	Navy should provide missing scan/gamma static data.	
TU006	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	K-40 FSS has a different slope than other radionuclides FSS (includes negative values) Large range of K-40 results. Ac-228, Bi-214, and K-40 have slope breaks indicating multiple populations.	2	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR  4) One Bi-214 result in FSS reported at 0.  5) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.	Onsite lab data inconsistent with off-site lab data	Inconsistencies noted (e.g., one Bi-214 result below 0)	0.5	Name(s) not provided	Name(s) not provided	1	1) One Bi-214 result in FSS reported at 0.  2) Pb-212 results were higher for TU006 than the average for Parcels b and D-2.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) No confirmatory/biased samples collected for FSS  2) One Bi-214 result in FSS was below zero.  3) Large range of K-40 values (2.778 - 19.527 pCi/g)  4) High static count recorded at 9,132 cpm compared to surrounding TUs. Offsite samples from Eberline Services are inconsistent with Ac-228 data from all TUs.  5) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.	Navy should provide missing scan/gamma static data.	
TU007	2	1) Cs-137 results all low, with multiple negative results - indicating a data quality issue  2) One outlier for Bi-214 and Ac-228, three outliers for K-40 identified.  3) Three FSS samples have unusually small variance	Slope breaks in K-40 and Ac-228 FSS datasets indicating multiple populations	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR  4) TU007 has the highest static count of 9,132 cpm compared to surrounding TUs. No signature form the site RSO was recorded.	Inconsistent - sample 10 had two different collection dates, and reported sample masses were different between onsite and offsite lab. It appears the onsite and offsite labs did not count the same sample.	Inconsistent - sample 10 had a collection date, and reported sample masses were different between onsite and offsite lab. It appears the onsite and offsite labs did not count the same sample.  Delayed counting of samples (4 days). One sample was recounted in 2010 as part of a quality review.	1	J. Cunningham	Name(s) not provided	1	1) Differences in recorded collection date for sample 10; reported sample masses for this sample were different with the offsite lab recording an unusually low mass. It appears the onsite and offsite lab did not analyze the same sample.  2) Delayed counting of samples (12 and 14 through 18) of four days after collection.  3) Sample 10 had 2 collection dates, and reported sample masses were different between onsite and offsite lab. It appears the onsite and offsite labs did not count the same sample.  4) Delayed counting of samples (4 days). One sample was recounted in 2010 as part of a quality review.  5) Several Ac-228 results at or below 0; outliers identified for Ac-228, Bi-214, K-40 indicating potential data quality issues and/or falsification  6) Highest count recorded was 9,132 cpm for location 004.  7) No confirmation/bias samples collected	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR  3) 16 of 18 FSS sample results for Cs-137 were less than zero.	Navy should provide missing scan/gamma static data.	
TU008	2	Ac-228 and Cs-137 results low, with multiple negative results - indicating a data quality issue	K-40 FSS has a different slope than other radionuclides FSS (includes negative values)	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Seven final systematic samples have results at 0 based on offsite lab results. This is inconsistent with onsite.  Low activities reported in samples 002, 007, 011, 012, 103; seven FSS samples have results at 0 based on offsite lab results.	Low values for Ac-228, Bi-214, and K-40 on the same day.  The K-40 data range large: from 1.03 through 18.74 pCi/g.	0.5	Name(s) not provided	Name(s) not provided	1	1) Seven FSS samples have results at 0 based on offsite lab results.; eight samples have low activities when compared to TU009.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130	Navy should provide missing scan/gamma static data.	
TU009	2	Ac-228 and Cs-137 results low, with multiple negative results - indicating a data quality issue	K-40 FSS has a different slope than other radionuclides FSS (includes negative values). Slope breaks in Ac-228, Bi-214, and K-40 data sets suggest different populations.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Consistent	1 Bi-214 FSS sample, 3 Ac-228 FSS samples and 1 K-40 FSS results below 0. 2 offsite (Eberline) FSS results at 0. K-40 range is large (-0.905 0 16.84 pCi/g).	0.5	Name(s) not provided	Name(s) not provided	1	1) Two samples counted one day. Remaining samples counted 3 days later.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following: Multiple Cs-137 results at or below 0  2) TU contained sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130	Navy should provide missing scan/gamma static data.	
TU010	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue. Bi-214 FSS_SYS has low variability.	None noted	6	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Fairly consistent	None	0		C. Fluty	1	1) Form notes, "FSS samples (247 and 257) analyzed on 6/22/2007. • FSS samples (246, 251, 258, 250, 252, 256, 253, 254, 259, 261, 262, 255, and 260) analyzed on 6/23/2007." • FSS samples (258 and 263) analyzed on 6/26/2007." Analysis of samples on different days suggests potential substitution.	1	1) RSO Signature missing from Gamma Static and Scan Data.  2) All samples analyzed in June 2007 except for one analyzed on October 8, 2010			
TU011	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	K-40 FSS has a different slope than other radionuclides FSS (includes negative values). Ac-228 and K-40 have slope breaks indicating multiple populations.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Offsite and Onsite data within 1 order of magnitude	None noted.	0.5	Name(s) not provided	Name(s) not provided	1	1) 11 samples counted 7 months later; potential for substitution.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) 11 samples recounted 7 months later. No explanation for this.	Navy should provide missing scan/gamma static data.	
TU012	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue. Bi-214 FSS_SYS has low variability.	K-40 FSS has a different slope than other radionuclides FSS. Slope breaks in Ac-228 and K-40 data sets indicating multiple populations.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Acceptable comparable data sets  Neither Eberline nor TestAmerica reported the sample mass	Ac-228 and Pb-214 have low means, 1 negative result is reported for Bi-214, Ac-228, and K040.	0.5	Name(s) not provided	Name(s) not provided	1	1) Different populations for K-40, Ac-228 and very low variability for Bi-214 FSS data set.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR		Navy should provide missing scan/gamma static data.	
TU013	2	Bi-214 and K-40 RAS results look like they are from a different population than other surveys. Cs-137 results all low, with multiple negative results - indicating a data quality issue	Ac-228, Bi-214, K-40 RAS data sets have a different slope than other surveys	2	1) Form notes, "Gamma static counts ranged between 4960 and 5536, an unusually narrow range for heterogeneous material. However, the gamma static counts are consistent with the gamma scan range, but are not consistent with the analytical results of the FSS dataset."	Results between offsite and onsite lab compare within 1 order of magnitude (10X). However, one sample was counted by the off-site lab more than 2 years later	1 Ac-228 FSS result below 0.	0	Name(s) not provided	J. Rosenhagen	1	1) Box Pots and QQ plots of RAS results for Ac-228, Bi-214, and K-40 appear to be from a different population than other surveys  2) Th-232 decay chain radionuclides are not in equilibrium in the FSS.  3) The Data Eval Form states in Section 4 "Gamma static counts ranged between 4960 and 5536, an unusually narrow range for heterogeneous material. However, the gamma static counts are consistent with the gamma scan range, but are not consistent with the analytical results of the FSS dataset." The inconsistencies in the pattern of data ranges and lack of comparable results indicates falsification most likely occurred.	1	1) Sampler/surveyor name not provided in Work Plan.	1) FSS Results for the thorium series included two negative Ac-228 results, Bi-212 at 0.47 pCi/g, and Ti-208 at 0. These concentrations do not indicate that the Th-232 decay chain is in equilibrium as would be expected for native soils. This data indicates there are data quality issues, and may also be associated with falsification of results.  2) Sample 6PBF5-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab.  3) Fss-SYS, FSS-BIAS and RAS samples all collected on 9/25/2006	1) Item 4 on the Data EvalForm states that gamma static counts ranged between 4960 and 5536 which is unusually narrow but is consistent with the gamma scan range, but not consistent with the analytical results. Please explain.  2) Sample 6PBF5-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab.	

TU014	2	1) Ac-228, Bi-214, and K-40 all have extremely low variance in the FSS results. Potentially indicates falsification  2) Cs-137 results all low, with multiple negative results - indicating a data quality issue	Negative results reported for Ac-228 and Bi-214 RAS survey, altering the slope so variance in populations can not be evaluated visually.	5	1) Gamma static and scan surveyor is not listed in the SUPR  2) Names of samplers/surveyors not provided in SUPR	The Data Eval form states "Onsite / offsite data is satisfactorily comparable (within a factor of 10x)."	1 Bi-214 FSS result below 0.	0.5	Name(s) not provided	Name(s) not provided	1	1) Ac-228, Bi-214, and K-40 all have extremely low variance in the FSS results. The unusual small variance in results can not be explained by any reasonable argument, therefore the reviewer believes this is an indication of falsification  2) Missing scan and static data in SUPR, in addition to the noted lack of normal variability in the FSS results for Ac-228, Bi-214, and K-40 indicate the data may have been falsified. Additionally, TU014 underwent at least five excavations. The need to perform multiple excavations and sampling may have provided a motive for falsifying results.	1	1) Gamma static and scan surveyor is not listed in the SUPR  2) No FSS Bias samples collected	This TU014 was located downstream and/or was connected to a radiologically-impacted building (Bldg. 114), indicating a higher likelihood that the Sewer lines and trench were radiologically contaminated.	Navy should provide missing scan/gamma static data.	
TU015	0	Cs-137 results all low, with multiple negative results indicating a data quality issue	Ac-228 and Bi-214 FSS_SYS have slope breaks, indicating multiple populations	3	1) Gamma static and scan results were not signed by the RSO	The Data Eval Form states "The comparison results for samples (110 and 124) were not equivalent for K-40, Ac-228, and Bi-214."	The Data Eval Form Section 3 (Bi-214) states "One sample seems to be inconsistent with the overall data population. Sample 119 has a result below 0. Two samples 110 and 113 were the highest at 1.479 and 1.455 pCi/g, respectively."	0	Name(s) not provided	P. Vigil	1	1) The Data Eval Form states "The comparison results for samples (110 and 124) were not equivalent for K-40, Ac-228, and Bi-214."  2) FSS samples (111 through 115, 117 through 124 and 127) were counted on 1/7/2007. Sample 125 was counted on 9/10/2010. Only samples 110, 116, and 126 were counted within 2 working days on 12/21/2006. The Christmas and New Year's holidays occurred during this period.	1	1) Scan and static measurement data did not contain the RSO signature.	1) The Data Eval Form 'Summary of Findings' Summary of Findings states "The mean results for Bi-212, Pb-212, and Ac-228 were all higher than average for Parcel B..." "The Bi-214 and Pb-214 mean results were also higher than average for Parcel B..."  2) One Bi-214 result was negative and offsite and onsite analyses of samples 110 and 124 are not consistent.  3) Soil probably used as backfill on Parcel C.		
TU016	2	1) Data Eval Form states, "Final systematic samples within the normal distribution. One outlier was identified for Ac-228."  3) Cs-137 results all low, with multiple negative results - indicating a data quality issue	Ac-228, Bi-214, K-40, Cs-137 FSS data sets have some negative results, indicating data quality issues. AC-228, B-214, and K-40 data plots have slope breaks indicating multiple populations.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	The data are not consistent for Ac-228 and K-40; the offsite lab results included zero values for Ac-228.	1 Ac-228 FSS result is below 0, K-40 range large (5.28 - 21.18 pCi/g).	0.5	Name(s) not provided	Name(s) not provided	1	1) Missing scan and static data and signature of surveyors or samples missing  2) Inconsistency between offsite and onsite lab results between onsite and offsite lab, large range of K-40 values  3) Long time interval between when samples 066, 068, 073, and 078 were collected (2006 ) and analyzed (9/13/10). Data Eval Form states "FSS samples (066, 068, 073, and 078) were analyzed on 9/13/2010. The sample collection date was on 12/28/2006.	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of surveyors/samplers not provided in SUPRs.		Navy should provide missing scan/gamma static data.	
TU017	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	K-40 FSS_SYS has slope breaks indicating multiple populations.	1	1) Form notes, "The static survey was dated 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006. The static survey was approved on 3/6/2008 as indicated in Attachment 1 of the SUPR document. The highest count was recorded at 6.126 cpm for sample location 081. No signature from the site RSO was recorded on this survey."  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	The Data Evaluation Form states "The offsite lab is inconsistent with the onsite data for Ac-228 results because the offsite lab did not detect Ac-228 in certain samples. This inconsistency by the offsite lab is not evidence of potential data falsification by the onsite staff." The reviewer notes that while the fact that the offsite lab analysis was inadequate to detect Ac-228 does not necessarily indicate falsification, it does indicate a lack of reliability of the data, which is equally problematic if the data is not deemed usable for the intended purpose of demonstrating compliance with the ROD.	None noted.	0.5	Name(s) not provided	Name(s) not provided	1	1) Logic Test 4 states FSS samples 072, 076, 077, 079, 080, and 081 analyzed within 2 working days. FSS samples 064, 065, 070, and 075 were analyzed on 12/1/2006. FSS samples 067, 069, 073, and 078 were analyzed on 9/13/2010. The analysis of samples over 3 years later is suspicious.  2) The approval data for the Static Survey of 3/6/2008 pre-dates when the Static Survey was conducted on 11/28/2006. The Data Evaluation Form states "The survey date seems to be a mistake." However, the reviewer notes that the difference in dates is unusual and can not be dismissed under an assumption that this was a mistake.  3) The Data Evaluation Form states "The scan survey was performed on 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006". The reviewer notes that given the fact that the scan, static, and FSS survey/sample collection dates do not follow the expected chronological order, this is evidence of falsification of data.  4) The Data Evaluation Form states "The K-5 Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." The reviewer notes that a higher Pb-214 indicates elevated Ra-226 is present. Further investigation will be needed to identify what value of Ra-226 was reported by the lab compared to the elevated Pb-214 result in order to determine if this is an indication of data falsification or a data quality issue.	1	1) RSO signatures are missing from Static and Scan Survey data.  2) Sampler/Surveyor names are missing from the SUPR.	1) The Summary of Findings states "The K-5 Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb-214 and Ra-226 results from the analysis were comparable. This information would provide insight into whether results in TU017 were falsified or not.  2) The Summary of Findings states "The K-5 Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb-214 and Ra-226 results from the analysis were comparable. This information would provide insight into whether results in TU017 were falsified or not.	1. Section 4 states "The static survey was dated 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006. The static survey was approved on 3/6/2008 as indicated in Attachment 1 of the SUPR document. The highest count was recorded at 6.126 cpm for sample location 081. No signature from the site RSO was recorded on this survey." These statements are contradictory, stating the gamma static survey was approved on 3/6/08 but then stating the site RSO signature is missing.	
TU018	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	K-40 FSS_SYS has slope breaks indicating multiple populations.	2	1) Gamma static survey was performed on 12/21/2006 prior to the collection of the FSS samples. The static survey was approved on 5/12/2007." "No signature from the site RSO was recorded on this survey."  2) Names of samplers not provided in SUPR.  The reason the Gamma Static Survey was conducted in December 2006 but not approved until May 2007 was not discussed in the Data Evaluation Form. In addition, the Data Eval Form states the static survey was approved, but also states the site RSO signature is missing. It is unclear what personnel approved the survey data and whether such staff was qualified to approve radiological data in lieu of the RSO. Also, the highest gamma static result, 6112 cpm, is below the range of gamma scan data, 4,800 to 7,000 cpm, which is suspicious.	1) Ac-228 data generated onsite is inconsistent with Ac-228 data from offsite laboratory. 2) Form also notes, "All FSS samples (048 through 065) collected on 12/21/2006. However, two FSS samples (055 and 065) were reported from the offsite lab with a collection date of 12/19/2006."	1) One Ac-228 FSS result was reported below 0.	1	R. Roberson	Name(s) not provided	1	1) The Data Evaluation Form Summary of Findings states "The K-5 test flagged Pb-214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212, presented higher-than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potential data falsification." The reviewer notes, however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-226, but the Data Evaluation Form does not state if comparable Ra-226 results were reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomalous. Further investigation by the Navy is needed.  2) The Data Evaluation Form Logic Test 4 provides FSS analysis dates, as follows: "FSS samples 048 through 052, 054, 055, 056 through 062, 064, and 065 were analyzed on 1/7/2007. ... FSS sample 063 was analyzed on 1/4/2007." Analysis of one sample on 1/4/07 suggests potential for substitution.	1	1) Site RSO signature missing from Gamma Static and Scan data in the SUPR.	Resample due to different collection dates for samples for on- and off-site labs and uncertainty due to multiple populations in K-40 data.	1) The Data Evaluation Form Summary of Findings states "The K-5 test flagged Pb-214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212, presented higher-than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potential data falsification." The reviewer notes, however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-226, but the Data Evaluation Form does not state if comparable Ra-226 results were reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomalous. Further investigation by the Navy is needed.	
TU019	2	Cs-137 results all low, with multiple negative results - indicating a data quality issue. Bi-214 FSS_SYS and FSS_Bias have low variability. Ac-228 and K-40 FSS_Bias have higher mean and lower variability than the FSS_SYS data set.	Ac-228, K-40, and Cs-137 data sets include negative values, indicating data quality issues. Ac-228, Bi-214, and K-40 FSS_SYS plots have slope breaks indicating multiple populations.	1	1) Gamma static and scan date and time not provided in the SUPR  2) Gamma scan survey was performed on 9/29/06 at 1013, during FSS sample collection. Collection of scan data at the same time that FSS samples are collected is suspicious because the MARSSIM approach requires the gamma scan data be collected to inform the development of a sufficiently robust FSS survey design.	1) The Data Evaluation Form states that the data are consistent. 2) However, the form notes, "For Final Systematic Sample 014, the onsite/offsite (Eberline) mass amounts agree. Eberline received both samples 014 and 027 on the same date (11/3/06); however, for sample 027, the Eberline reported mass (325 grams) is 102 grams less than the initial onsite mass of 427 grams."	Two Ac-228 FSS results are reported near 0.	0	Name(s) not provided	P. Vigil	1	1) On- and offsite samples had a different weight for sample 027 (difference of 102 grams). 2) Bi-214, K-40, Bi-212, all had the 3rd lowest results of all the TUs in Parcels B & D-2. In addition, Pb-214 mean results is the lowest of all TUs in Parcels B & D-2. The Data Evaluation Form argues that adjacent TU012 also had abnormally low mean concentrations in an area where the two TUs adjoin and therefore may represent a different soil type is represented rather than an indication of falsification. The reviewer acknowledges this may be the case but with the existing data, and the extensive data quality issues highlighted in data throughout Parcel B, sufficient information does not exist to determine the reason for the low values. The reviewer also notes that it is also possible the unusually low mean values for this data may be due to falsification.	1	1) Gamma static and scan surveyor is not listed in the SUPR			
TU020	2	1) For Bi-214, FSS_SYS and FSS_Bias have low variability and FSS_Bias has a lower mean. For K-40, the opposite is true, FSS_Bias has higher variability - suggesting potential multiple sources of samples. 2) Cs-137 results all low, with multiple negative results - indicating a data quality issue.	Ac-228, K-40, and Cs-137 data sets include negative values, indicating data quality issues. However, K-40 data set has slope breaks indicating multiple populations.	1	1) Gamma static and scan date and time not provided in the SUPR  2) Gamma Static Survey data ranged between 5,583 and 6,708 cpm. The Data Evaluation Form states this range is consistent with the gamma scan data; however the scan survey data ranged from 4.200 and 7,100 cpm. Therefore, the Static data is not consistent with the scan data since the range for the static surveys is very small compared to the scan data and what would be expected for environmental surveys of land areas.	The Data Evaluation Form states "[N]o direct comparison could be made between onsite and offsite data." The reviewer requests the Navy provide clarification regarding this statement.	3 Ac-228 Biased results below or near 0.	0	Name(s) not provided	P. Vigil	1	1) Gamma static and scan date and time not provided in the SUPR  2) Gamma Static Survey data ranged between 5,583 and 6,708 cpm. The Data Evaluation Form states this range is consistent with the gamma scan data; however the scan survey data ranged from 4.200 and 7,100 cpm. Therefore, the Static data is not consistent with the scan data since the range for the static surveys is very small compared to the scan data and what would be expected for environmental surveys of land areas.  3) Suspect worker involved in data collection at TU020.	1	1) Gamma static and scan date and time not provided in SUPR.	Form notes, "Ac-228 mean result is the lowest of all TUs in Parcels B & D-2. ... Bi-214 mean result is 3rd lowest of TUs in Parcels B & D-2. ... K-40 mean result is 3rd lowest of TUs in Parcels B & D-2. ... Pb-212 mean result is 3rd lowest of TUs in Parcels B & D-2. ... Pb-214 mean result is the lowest of all TUs in Parcels B & D-2." Form concludes these are within the expected ranges.	The Data Evaluation Form states "[N]o direct comparison could be made between onsite and offsite data." The reviewer requests the Navy provide clarification regarding this statement.	
TU021	2	1) Bi-214 results have very low variability. Form notes, "Bi-214 standard deviation is unusually low (0.11 pCi/g) for Final Systematic samples." 2) Cs-137 results all low, with multiple negative results - indicating a data quality issue.	1) Ac-228 and K-40 data sets include negative values. May indicate data quality issues. However, K-40 data set has slope breaks indicating multiple populations. 2) Form notes, "Bi-214 plot is unusually horizontal (low variance - 0.34) for Final Systematic samples."	1	1) Gamma static and scan date and time not provided in the SUPR  2) Gamma static and scan range of data values too narrow for measurement of heterogeneous environmental land areas.	For the FSS sample 06, the onsite/offsite K-40 results differ by more than a factor of 10x (7.796 vs. 0.707). Other data compares satisfactorily. The reviewer notes that having radionuclides of concern have comparable values between onsite and offsite data, but very different K-40 results has been proven in the past to be an indication of data falsification and is highly suspect for TU021.	1 Ac-228 FSS result below 0.	1	A. Jahr	Name(s) not provided	1	1) Gamma Static Survey data ranged between 5,728 and 6,427 cpm. In contrast to the Data Evaluation Form for TU0020, the Data Evaluation Form for this TU 0021 states this range is an unusually narrow range for heterogeneous soil but is consistent with the gamma scan range and the FSS dataset. Scan survey data ranged from 5.200 and 6,800 cpm. The reviewer notes that the Static and Scan data have too narrow of a range and therefore is suspect for falsification.  2) For the FSS sample 06, the onsite/offsite K-40 results differ by more than a factor of 10x (7.796 vs. 0.707). Other data compares satisfactorily. The reviewer notes that having radionuclides of concern have comparable values between onsite and offsite data, but very different K-40 results has been proven in the past to be an indication of data falsification and is highly suspect for this TU021.  3) Section II, Item 2 of the Data Evaluation Form states "Final Systematic samples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags.	1	Numerous discrepancies noted in the data (i.e., unusually low values and data ranges, negative Ra-226 values), discrepancies in K-40 results between onsite and offsite labs, yet no other sampling was conducted to confirm conditions at TU021.	1) TU0021 contained the sewer line that was connected to or downstream from the radiologically-impacted Building 103.  2) Section II, Item 2 of the Data Evaluation Form states "Final Systematic samples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags. Reviewer requests further clarification of the statements and where information about a disparity between units and days can be found.  3) Section II, Item 2 of the Data Evaluation Form states that a review of the Ra-226 data shows that the Ra-226 concentrations in several samples have large negative values and are "apparently statistically indistinguishable from the remediation action level." The reviewer notes that large negative values of the Ra-26 data indicates a data quality issue and therefore such data is not reliable for decision making/demonstrating the ROD criteria has been met.		

TU022	0	1 For Bi-214, FSS_SYS and FSS_Bias samples have low variability. Also, for Bi-214, FSS_Bias samples have lower variability and mean than FSS_SYS samples. However, for K-40, FSS-Bias samples have a higher mean and higher variability than the FSS_SYS samples. 2)Cs-137 results all low, with multiple negative results - indicating a data quality issue	Ac-228 and K-40 data sets include negative values, indicating data quality issues.	1	None.	Data Evaluation Form states "Data comparable with the following exception: 6PBFS-022-34 Pb-210 value (0.18 vs 4.0189 pCi/g).	2 Ac-228 FSS results below 0.	0	Name(s) not provided	P. Vigil	0	1	None.	As in all other TUs, significant data quality issues exist, making the data unreliable for decision making and in demonstrating compliance with the ROD release criteria.			
TU023	2	1. No Cs-137 plots from Navy 2. Very low variability for Bi-214	Characterization samples appear to be a different population. K-40 sets have different slopes, suggesting different populations	4	No name listed for either scan or static gamma measurements			0.5	No name provided	No name provided	1	1	1) 2) No name of static or scan surveyor provided in SUPR 2) Some samples were counted between 03/14/2207 and 03/19/2007. Samples #174, #179, #181-183 were counted on 09/09/2010 and 09/10/2010. 2) No name of static or scan surveyor provided in SUPR	FSS samples could have been substituted in 2010 when recounted 3 years after collection. Recommend resampling due to low variability Bi-214 and uncertainty about recounted samples.			
TU024	2	For Bi-214, biased samples have lower variability than FSS_SYS	FSS_SYS has slope break indicating different populations and slope different than biased samples for Bi-214.	2) Excavatio n of TU24 was initiated on 09/25/2006 in trench segment 06-B07-24 1-C. Excavatio n was complete d on 10/24/2006. Eighteen systemati c FSS soil samples were collected from TU24 and submitted to the	1) Date and time of static survey not provided in the SUPR. The static survey results ranged from 4,000 to 6,800 gcpm, which was consistent with scan survey results and FSS sample results. 2) Gamma survey results ranged from 3,800 to 6,800 gcpm, which was consistent with static survey results and FSS sample results. No measurements above the investigation level of 7,300 gcpm were identified during the performance of gamma scans in Trench Unit 24. Scan survey performed on 11/16/2006 at 09:30 (from scan record) prior to collection of most final systematic samples. The following samples were collected prior to static survey: 6PBFS-024-99, -100, -101, and -102.	Sample 6PBFS-024-114 has an onsite lab mass of 320 g and an offsite lab mass of 327 g. The offsite lab did not report a mass for sample 110.		1	R. Zahensky	No name provided	2	1	1) FSS samples were collected on 11/16/2006. FSS confirmatory/biased samples were collected on 11/01/2006. 2) One final systematic sample has a result below 0 for Bi-214. Sample may have been substituted 3) on- and off-site lab sample had different weights	Recommend resampling due to uncertainty - different sample masses, low variability for Bi-214			
TU025	0		K-40 high variability and range	1	Static survey date and time not provided in SUPR.			1	R. Zahensky	No name provided	1	1	1. Samples were counted onsite 10/13/2006, with the exception of #2, #6, and #12, which were counted on 09/13/2010. Sample #14 was counted offsite on 11/22/2008. Substitution possible.	Some uncertainty because samples counted over 4 years. 2010 counts may be due to recounting at request of Navy or CDPH.			
TU026	0	Several Final Systematic Bi-214 samples present as outliers	Bi-214 Final Systematic samples indicate the potential for at least two different data populations.	1	Scan survey performed on 12/14/2006 at 09:30 during FSS sample collection. Gamma Scan range is narrow but consistent with static measurements and the FSS dataset and less than the 3-sigma threshold.			0	No name listed	J. Rosenhagen	0	0		Several Final Systematic Bi-214 samples present as outliers			
TU027	0	Bi-214 has low variability	Slope break or outliers in K-40 plot	1	1) Static survey date and time not provided in SUPR Gamma static dataset consistent with scan data and Final Systematic sample dataset. 2) Scan survey performed on 11/04/2006 at 10:15 during Final Systematic sample collection. Gamma scan dataset consistent with static data and Final Systematic sample dataset.			1	R. Roberson	No name provided	1	1	Form notes, "FSS samples excluding #2 and #3 were counted onsite from 11/07/2006 to 11/09/2006. FSS samples #2 and #3 were counted on 09/21/2010. Sample #16 was counted offsite on 11/25/2008."	FSS samples excluding #2 and #3 were counted onsite from 11/07/2006 to 11/09/2006. FSS samples #2 and #3 were counted on 09/21/2010. Sample #16 was counted offsite on 11/25/2008.			
TU028	0	Bi-214 has low variability	Slope breaks on K-40 plot, may be 3 or more populations	1	Static survey date and time not provided in SUPR. Scan survey performed on 11/07/2006 at 08:00 during Final Systematic sample collection. Gamma scan dataset consistent with static data and Final Systematic sample dataset.	Form notes, "FSS samples excluding #5, #9, and #15 were counted onsite on 11/08/2006. Sample #5 was counted onsite on 09/20/2010 and was analyzed offsite by Eberline on 12/11/2006. Sample #9 was counted onsite on 09/13/2010. Sample #15 was counted on 10/08/2010. Sample #12 was counted offsite by Eberline on 12/11/2006 and offsite by TestAmerica on 11/24/2008. "		1	R. Zahensky	No name provided	1	1	Some samples counted years later, unclear if these were the original samples.	No static survey date and time, no sampler name.			
TU029	0		Slope breaks on Ac-228, Bi-214, K-40 plots, indicating as many as 3 populations.	1	1. No signature from the site radiation safety officer (RSO) was recorded for static or gamma scan surveys. 2. Gamma scan fairly narrow range.			0	No name provided	J. Rosenhagen	1	1	On-site lab counted samples over 4 days.	Single set of FSS_SYS samples suggests falsification less likely; work done in 2006.			
TU030	0	Bi-214 has low variability	Slope breaks on K-40 plot, may be 3 or more populations	1	Static surveyor name not provided in SUPR.			0	No name provided	P. Vigil	0	1	Static surveyor name not provided in SUPR.				
TU033	0		Slope breaks on Ac-228, Bi-214, K-40 plots, indicating as many as 3 populations.	1	Static survey date and time not provided in SUPR.			1	R. Zahensky	No name provided	0	1	No static survey date and time, no sampler name.				
TU036	0		Slope breaks on Ac-228, Bi-214, K-40 plots, indicating as many as 3 populations.	1				0	No name provided	P. Vigil	0	1	Sampler/surveyor name not provided in SUPR.				
TU037	2	Bi-214 FSS_SYS has lower variability than other sets	Each data set has a different slope on the K-40 plot, and to some extent on the Ac-228 and Bi-214 plots. Slope breaks on Bi-214 and K-40 plots suggest different populations.	2	Form notes that the gamma static form was undated.			0	No name provided	C. Fluty	1	1	Form notes, " Samples were counted on 03/14/2007 or 03/15/2007; five samples were re-analyzed in 2010 during lab method review by EPA and CDPH" and ". A combination of samples analyzed in March 2007 and reanalyzed samples from September 2010 were reported as the FSS survey results." Unclear why the original on-site lab results were replaced. May explain different populations, or not.	Gamma static form undated.	Resample due to low Bi-214 FSS_SYS variability, evidence of multiple data sets.		
TU039	2	1. For Bi-214, FSS_Bias have lower mean than FSS_SYS. For K-40, FSS_Bias have lower variability and a much lower mean.	1. For Ac-228 and K-40, FSS_SYS and FSS_Bias have very different slopes, suggesting data came from very different populations. FSS_SYS has slope breaks indicating different populations in that set. 2. Form notes, "For Ac-228 FSS samples, the regression line is more vertical than expected (high variability)."	1	Form notes, "Static survey date and time not provided in SUPR. "	Form notes, " Sample 6PBFS-039-14 was reported at 337 g by the offsite lab and 377 g by the onsite lab. Sample 6PBFS-039-09 was not reported by the offsite lab."		0	No name provided	P. Vigil	1	1	Form notes, "Samples 6PBFS-039-10, -12, -13, -16, -17 through -19, and -22 through -26 were all analyzed more than 2 days after collection."	No static survey date and time, no sampler name.	Resample due to different weights for on-site/off-site lab samples, fact that samples were counted later than others, indications of different populations for Bi-214, K-40, and Ac-228.		
TU040	2	1. Bi-214 and Ac-228 FSS_Bias have lower variability and means than other data - extreme difference for Bi-214. 2. Form notes, "Notes: Standard deviation is greater than the mean for TU040 (Bi-214). "	1. For Ac-228 and K-40, FSS_SYS and FSS_Bias have very different slopes, suggesting data came from very different populations. FSS_SYS has slope breaks indicating different populations in that set. 2. Form notes, "Final systematic samples display characteristics of at least two different data population for Bi-214 and Ac-228. "	2	1. For gamma static form notes, "The static count range was 4,800 to 6,200 cpm. No signature from the site radiation safety officer (RSO) was recorded on this survey." 2. For gamma survey, form notes, "Scan range for the 2350-1 Instrument is 4,000 to 5,400 cpm. No signature from the site RSO was recorded on this survey. The scan data are not consistent with the static data or the FSS lab data." 3. Scan and static surveys have low range.	Form notes, "Data is inconsistent for Ac-228, Bi-214, and K-40. The offsite lab results appear to be erratic."	Some samples 0 for Ac-228, Bi-214, K-40	0	No name provided	C. Fluty	1	1	Form notes, "One FSS sample (040) were analyzed on 02/28/2007." This suggested	No signature from RSO on gamma static or scan surveys.	Resample due to different weights for on-site/off-site lab samples, indications of different populations for Bi-214, K-40, and Ac-228, and low variability and evidence of different populations for Bi-214, K-40, and Ac-228, and K-40.		
TU041	0		Slope breaks on Ac-228, Bi-214,and K-40 graphs indicating different populations.	1	Form notes, "Static survey date and time not provided in SUPR."			1	R. Roberson	No name provided	0	1	No static survey date and time, no sampler name.				
TU042	2	FSS_Bias have lower variability than FSS_SYS for Ac-228, Bi-214, K-40.	FSS_SYS and FSS_Bias have different slopes for Ac-228, Bi-214, and K-40 suggesting different populations between data sets.	5	Form notes, "Scan range for the 2350-1 Instrument is 3,800 – 5,400 cpm. The 3-sigma investigation level for the 2350-1 Instrument was 8,948 cpm. No signature from the site RSO was recorded on this survey." Also, no signature for gamma static survey.	Form notes, " Data is inconsistent in comparison to Ac-228, K-40, and Bi-214."		1	R. Roberson	No name provided	1	1	FSS_SYS Samples counted on 4 days and not sequentially.	No signature from RSO on gamma static or scan surveys.	1. FSS_SYS Samples counted on 4 days, and not sequentially. Form notes: " • FSS sample (132) analyzed on 07/14/2007 • FSS samples (117, 121, 122, 126, 127, 129, 131, and 134) analyzed on 07/17/2007 • FSS samples (118, 133, 120, 124, 123, 125, 128, and 130) analyzed on 07/18/2007. • FSS sample (119) analyzed on 07/19/2007." 2. Resample due to samples being counted on 4 different days and not sequentially (suggests potential for sample substitution), FSS_Bias having lower variability than FSS_SYS for Ac-228, Bi-214, and K-40, and evidence of different populations between data sets on Q-Q plots.		
TU043	2		FSS_Bias has slope breaks for Bi-214 and K-40 suggesting different populations.	2	Form notes, "Static survey date and time not provided in SUPR."	1. Form notes, "6PBFS-043-113 had an onsite lab mass of 334 grams and an offsite lab mass of 332 grams." 2. Form notes, "For sample 6PBFS-043-122, the difference between Ac-228 concentrations were significantly large between onsite (0.874 pCi/g) and offsite (0.0 pCi/g)."		1	R. Zahensky	No name provided	1	1	1. FSS_samples were counted over 1 week, suggesting possible substitution. Form notes, "Samples were counted from 03/21/2007 through 03/28/2007." 2. Different weights (2 grams) between on-site and off-site lab.	No static survey date and time, no sampler name.	Resample due to sample counting over 1 week (potential for substitution),different weights between on-site and off-site lab, large difference in 1 Ac-228 result, and evidence of different populations on Q-Q plots.		

TU044	2		K-40 has multiple slope breaks suggesting different populations. Bi-214 and Ac-228 may also have slope breaks, but more subtle.	1	Form notes, "Date and time of static survey not provided in SUPR."			0	No name provided	C. Fluty	1	1. FSS samples were counted over 6 days suggesting possible substitution. Form notes, "Samples were counted between 03/23/2007 and 03/28/2007." 2. Samples have different weights. Form notes, " 6PBFS-044-01 has an onsite lab mass of 357 grams and an offsite lab mass of 374 grams, 6PBFS-044-12 has an onsite lab mass of 318 grams and an offsite lab mass of 324 grams."	1	No static survey date and time, no sampler name.	Resample due to FSS sample counting over 6 days (potential for substitution), significant differences between on-site and off-site sample weights (not clear the same samples were counted), and the evidence for multiple populations based on the K-40 Q-Q plot.		
TU045	2		1. For K-40 and to a lesser extent Ac-228 and Bi-214, FSS_SYS has different slope than other data sets, and slope breaks indicating different populations. Form notes, "The Ac-228 and K-40 results display characteristics of multiple data populations."	6	Form notes, " Static survey date and time not provided in SUPR. Gamma static dataset is consistent with gamma scan dataset and inconsistent (low variability) with FSS sample dataset."			0	No name provided	P. Vigil	1	1. Form notes, "FSS samples were counted within 2 days of collection. FSS-BIAS samples 6PBFS-045-001 and -035 were counted between 23 and 34 days after collection." Suggests possible substitution. 2. Low variability and inconsistent gamma static data.	1	No sampler/surveyor name in SUPR	Resample due to multiple populations for Bi-214, Ac-228, and K-40 and counting 2 FSS_Bias samples much later (suggests substitution).		
TU046	2		1. K-40 has multiple slope breaks, suggesting different populations. Ac-228 may have slope breaks.	1				0	No name provided	C. Fluty	1	1. Form notes, " None of the FSS samples (6PBFS-046-01 to -18) were analyzed within 2 working days." Also, "Sample -01 was counted on 04/10/2007," which is more than 2 weeks after collection. Possible indication of sample substitution.	1	No sampler/surveyor name in SUPR	Resample due to multiple populations for K-40 and possibly B-214 and because one FSS_Bias sample was counted on a completely different day than the others (which were not counted within 2 days of collection). These indicate possible sample substitution		
TU047	2	1. K-40 FSS_Bias has low variability (much lower than FSS_SYS). Mean is also lower than FSS_SYS.	1. K-40 data sets each have different slope and FSS_SYS has slope breaks, indicating different populations. Ac-228 and Bi-214 data sets also have different slopes and slope breaks, but less pronounced than K-40."	3				0	No name provided	C. Fluty	1	1. Form notes, "FSS samples 6PBFS-047-74 through -80, -82 through 90 were analyzed on 06/30/2007. FSS samples 6PBFS-047-81 and -91 were analyzed on 06/22/2007." Also, "FSS-Bias samples 6PBFS-047-25 through -43 were analyzed 24 days after collection. All other samples were counted within 2 weeks of sample collection." This suggests potential substitution.	1	No static survey date and time, no sampler name.	Resample due to multiple populations for K-40 and probably for Ac-228 and Bi-214, and because 2 samples were analyzed on a different day, suggesting potential substitution. FSS_Bias samples, which Q-Q plots indicate are a different population were counted 24 days after collection.		
TU048	2		1. Ac-228 and K-40 have slope breaks indicating different populations. Bi-214 has low variability. 2. Form notes, " The graph for Bi-214 shows relatively low variability.	1		Form notes, "The Ac-228 data are not consistent. The offsite lab reported one Ac-228 result at zero."		0	No name provided	P. Vigil	1	1. Form notes, "• One FSS sample [012] was analyzed on 05/07/2007. • One FSS sample (006) was analyzed on 05/11/2007. • One FSS sample (002) was analyzed on 05/15/2007. • One FSS sample (008) was analyzed on 09/09/2010. • One FSS sample (005) was analyzed on 09/10/2010. • One FSS sample (016) was analyzed on 09/05/2010. • FSS samples (001, 003, 004, 007, 009, 010, 011, 013, 014, 015, 017, and 018) were analyzed on 05/12/2007." 2. Even without the samples analyzed in 2010, the fact that samples were counted on different days suggests the potential for falsification.	1	No signature from RSO on gamma static or scan surveys.	Resample due to potential substitution - samples were counted over 12 days according to the form, but only one sample was analyzed on some days. Also, there is little variability for Bi-214 and evidence of multiple populations.		
TU049	2	For Bi-214, Cs-137, and Ac-228, FSS_SYS has very low variability and a lower mean than other data sets. However, for K-40, FSS_Bias has very low variability.	1. Ac-228, Bi-214, and K-40 FSS_SYS has a different slope and slope breaks indicating multiple populations. Most pronounced in the case of K-40.	5	1. Unusually low range for gamma statics. Form notes for statics, "The static data ranged from 4,200 to 5,200 cpm... There is hardly any essentially no overlap between the scan and the static data. The static data are not consistent with the FSS data. The range of the static measurements is approximately the range expected from statistical counting variability." 2. Form notes for gamma scan "The scan range for the 2350-1 Instrument is 5,000–7,000 cpm. The 3-sigma investigation level for 2350-1 Instrument was 8,975 cpm... The scan data are inconsistent with the static data and somewhat consistent with the FSS data."	Form notes, "Data is inconsistent in comparison to Ac-228. Two FSS sample (310 and 314) results from the offsite lab were recorded at zero. The onsite lab data were approximately 1 pCi/g."		0	No name provided	P. Vigil	1	Unusually low range for gamma statics; gamma static survey is inconsistent with gamma scan and FSS data.	1	No signature from RSO on gamma static or scan surveys.	1. TU49 modified after 5 rounds of excavation and sampling to move contaminated area to TU 50. 2. Resample due to low variability gamma statics, which were inconsistent with FSS data, as well as low variability FSS_SYS data for Bi-214, Ac-228, Cs-137 and low variability FSS_Bias for K-40.		
TU050	2	1. K-40, Cs-137 FSS_SYS have low variability.	1. FSS_Bias line has different slope for Ac-228 and Bi-214. 2. Form notes, "The quantile plots indicate multiple soil types were sampled."	13	1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,998 and 4,855 cpm. Mean result of 4,201 ±211 cpm." 2. For gamma scan, form notes, "Gamma scan range is 4,350 –14,200 cpm, with the investigation level at 7,100 cpm. Gamma scan dataset is not consistent with static data or Final Systematic sample dataset." 3. Form concludes that the "Final Systematic samples appear to have been properly collected in the areas of highest gamma scan and hot spots weren't avoided." However, without GPS data how can this be certain and why weren't there FSS_Bias samples at the hot spots?	1. Form notes, "Eight samples were counted by offsite labs for confirmation. Seven of the offsite results were above the minimum detectable activity for Ra-226. The RPDs for these samples ranged from 22 to 166, indicating that the onsite lab's results were biased high."	1. For Bi-214 Form notes, "Final Systematic samples #482, 483, 484, and 486 have abnormally low results." 2. For Ac-228, Form notes: "Several Bias and Characterization samples have results at or below 0. Final Systematic samples #483, 484, and 486 have abnormally low results."	0	Name not provided	C Hughes	1	1. Form notes: "Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,998 and 4,855 cpm." Also, "Gamma scan dataset is not consistent with static data or Final Systematic sample dataset." 2. Low variability for Bi-214, Ac-228, K-40 FSS_Bias samples	1	SUPR did not have static survey date and time	1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and inconsistency between gamma scan and FSS data set. Also, low variability of B-214, AC-228, K-40 FSS_Bias samples suggests these are not related to the gamma scan data.		
TU050A	2	1. K-40, Cs-137 FSS_Bias have low variability, for K-40 appears to be a different population	1. K-40 FSS_Bias samples line has a different slope than the other plotted data. 2. Form notes for Ac-228, "The quantile plot for Ac-228 indicates that multiple soil types may be present in the trench unit."	7	1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,903 and 4,310 cpm. Mean result of 4,074 ±115." 2. For gamma scan, form notes, "Gamma scan range is 3,840 –12,580 cpm, with the investigation level at 7,100 cpm. Gamma scan dataset is not consistent with static data or Final Systematic sample dataset."	1. RPD for 7 samples was 74.31. 2. Form considered consistent.		0	Name not provided	C Hughes	1	1. Gamma static dataset low variability and inconsistent with scan data and Final Systematic sample dataset with results between 3,903 and 4,310 cpm. Also, "Gamma scan dataset is not consistent with static data or Final Systematic sample dataset."	1	SUPR did not have static survey date and time	1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and inconsistency between gamma scan and FSS data set. Also, there are multiple populations for K-40.		
TU051	2	1. For Ac-228 and Bi-214, FSS_SYS have low variability and appear to be a different population.	1. Ac-228 and Bi-214 FSS_SYS have lower slope suggesting different population.	23	1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static data are consistent with scan data (both low variability) and inconsistent with FSS sample dataset." 2. For gamma scan, form notes, "Gamma scan data is consistent with static dataset and inconsistent (low variability) with FSS sample dataset."	1. Form notes, " Observations: Comparing biased, characterization, and final systematic samples (21 samples), the average Ra-226 result reported by the offsite lab is 38.8% of the result reported by the onsite lab. "		1	B Evans	Name not provided	1	1. Gamma scan and gamma static data are inconsistent with each other and inconsistent with the FSS data. 2. Collection of FSS_SYS samples on two days may be indication of falsification, particularly since one sample, 336, was collected out of order on the 2nd day.	1	SUPR did not have static survey date and time	1. After 23 rounds of excavation and sampling, the Ra-226 contaminated portion of the trench became a new trench unit, TU 051A, but it is unclear if all of the Ra-226 contamination was in the area that became TU 051A from the beginning. 2. Form notes about dates FSS_SYS samples were collected, "FSS samples 6PBFS-051-334, -335, -337 through -340, -345 through -351 were collected on 02/18/2008. Samples -336, -341 through -344 were collected on 02/19/2008." Although the Form concludes this is not evidence of falsification, it could be, particularly, since sample 336 was collected out of sequence. 3. Resample due to inconsistent gamma scan and gamma static data, low variability gamma static data, evidence that there are different populations (low variability Ac-228 and Bi-214 FSS_SYS), and potential falsification associated with sampling over multiple days.		
TU051A	2	1. FSS_Bias samples appear to be a different population (low variability) for Ac-228, Bi-214, and K-40. 2. Bi-214 FSS_SYS set has low variability and for K-40, FSS_SYS has higher mean and lower variability.	1. For Bi-214, FSS_SYS set has higher slope than all of the other sets. 2. Form notes, "The graph is more horizontal than expected (low variability) for Bi-214. Final systematic samples display characteristics of at least two data populations for K-40."	9	1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static dataset inconsistent (low variability) with scan data and FSS sample dataset." 2. For gamma scan, form notes, "Gamma scan data is consistent with FSS sample dataset and inconsistent with static data. Scan range for the 2350-1 Instrument is 2,890 –13,200 cpm, 3-sigma investigation level for the 2350-1 Instrument is 7,048 cpm."	1. Form notes, "Two FSS samples sent for offsite analysis. Ra-226 results are lower for offsite samples." Also, "Some offsite samples were counted approximately 1 year later."	1. Form notes for Bi-214, Ac-228, and K-40: "Final systematic samples indicate the potential for at least two data populations. Bias, characterization, and final systematic samples display different characteristics from other samples."	0	Name not provided	C Hughes	1	1. Gamma static and gamma scan data are consistent with each other, but inconsistent with the FSS_SYS data. 2. Collection of a single FSS_SYS sample 2 days after collection of the others.	1	SUPR did not have static survey date and time	1. This TU was split from TU 051 after it underwent 23 rounds of excavation and sampling; 9 more round of excavation and sampling conducted on TU 051A (for a total of 32). 2. One FSS_SYS sample collected 2 days after the others. 3. Resample due to inconsistent gamma scan/static data with FSS data set, low variability Bi-214, Ac-228, and K-40 FSS samples, and collection of one FSS_SYS sample 2 days after collection of the others - possible substitution.		
TU052	0	1. FSS_SYS for Bi-214 has somewhat lower variability than other data sets.		2	1. Scan and static surveys consistent. Range of statics, 4,400 to 5,500 cpm.	1. Form notes, "Data are inconsistent in comparison to Ac-228. The offsite lab reported two final systematic samples (051 and 065) at 0."		0	Name not provided	C. Fluty	0		1	No signature from RSO for gamma survey and scans	1. Appears off-site lab had trouble with Ac-228 analysis.		
TU053	2	1. FSS_Bias samples for Ac-228, Bi-214, and K-40 have low variability and higher means than the other sample sets; K-40 appears to be a different population. 2. FSS_SYS for Bi-214 have low variability.	1. FSS_Bias plot with lower slope for K-40, Bi-214, and Ac-228.	4		1. Form notes, "Data is inconsistent. Samples 117 and 120 Ac-228 concentrations were not detected at the offsite lab after yielding results above the detection limit for the onsite lab. "	1. Form notes for Ac-228, Bi-214, and K-40: " : Bias and characterization samples indicate the potential for at least two data populations."	0	Name not provided	P. Vigil	1	low variability of FSS_SYS and FSS_Bias for Bi-214, apparent different population for K-40 FSS_Bias, and inconsistent off-site lab results.	0		1. Resample due to low variability of FSS_SYS and FSS_Bias for Bi-214, apparent different population for K-40 FSS_Bias, and inconsistent off-site lab results.		
TU054	2	1. FSS_SYS for Bi-214 and K-40 have somewhat lower variability than other data sets.	1. K-40 characterization sample set has flatter slope.	5	1. Scan and static data sets consistent, scan noted to be on the high side of the gamma scan range. Also consistent with FSS samples.	1. 1 out of 7 off-site lab samples had inconsistent weight with the on-site lab samples		1	R. Roberson	Name not provided	1	1. One sample sent to the off-site lab had a different weight than the sample counted by the off-site lab; suggests a different sample may have been sent.	1	1. No date or time for gamma statics in SUPR.	1. 1 out of 7 off-site lab samples had inconsistent weight with the on-site lab samples, which may be an indication of falsification. 2. Resample due to inconsistent weight of one off-site lab sample, low variability FSS_SYS for Bi-214 and K-40, apparent different population of K-40 characterization samples.		
TU055	2	1. FSS_SYS for Ac-228 and Bi-214 and FSS_Bias for Bi-214 and Cs-137 have low variability. 2. Form notes, "Sample distribution of final systematic is slightly less variable compared to Bias and characterization data population."	1. For K-40, FSS_SYS and FSS_Bias appear to be different populations.	4	1. Static maximum (6,889 cpm) inconsistent with gamma scan maximum (14,620 cpm). No signature from RSO.	1. Form notes that "Data comparison is relatively consistent for Ac-228, Bi-214, and K-40."		1	J. Cunningham	Name not provided	1	Static max is less than 1/2 of the gamma scan max.	1	1. No RSO signature for gamma scans or survey.	1. Resample due to low variability of FSS_SYS for Ac-228 and Bi-214 and FSS_Bias for Bi-214 and Cs-137 and inconsistent gamma statics.		
TU056	2	1. K-40 characterization samples have low variability and FSS_Bias samples have lower mean and variability than FSS_SYS samples. May indicate multiple sources.	1. For K-40, FSS_SYS and FSS_Bias appear to be different populations.	5		1. Form notes, "Data is inconsistent in comparison to Ac-228, K-40, and Bi-214. Two Ac-228 results were reported at zero by the offsite lab."		0	Name not provided	P. Vigil	0		1	1. No RSO signature for gamma scans or survey.	1. Resample due to low variability and inconsistent K-40 samples, inconsistent off-site lab results.		EPA Statistician performed more detailed statistical analysis included separately
TU058	2	1. FSS_SYS and FSS_Bias for Bi-214 have low variability.	1. Appears to be 2 populations for K-40 FSS_SYS	2	1. Form notes, "The scan data is consistent with the gamma static dataset. The gamma scan and static data do not reflect the range of results from the laboratory data."	1. Form notes, "Data is inconsistent in comparison to Ac-228, Bi-214 and K 40. Two FSS samples (57 and 63) have results at 0 based on the offsite data."		0	Name not provided	P. Vigil	1	1. Gamma scan and gamma static data are inconsistent with the FSS laboratory data.	1	1. No RSO signature for gamma scans or survey.	1. Resample due to gamma scan and static data inconsistency with FSS lab data, multiple populations for K-40, and low variability Bi-214 FSS data.		
TU060	2	1. FSS_SYS for Bi-214 has very low variability.		3	1. Gamma static max about 650 cpm lower than gamma scan max.	1. Form notes, "The sample mass was inconsistent for sample 092. The onsite lab reported 366 grams while the offsite lab reported 296 grams." 2. FSS Samples counted by off-site lab over a year later. 3. Form notes, "Data is inconsistent in comparison to Ac-228. Two FSS samples (092 and 109) have results at zero based on the offsite data. The offsite data Vs onsite data is inconsistent in comparison to Ac-228 and K-40."		1	R. Roberson	Name not provided	1	1. On- and off-site weights for sample 92 were different, suggesting possible sample substitution. 2. Form notes inconsistent results between off-site and on-site lab for multiple radionuclides.	1	1. No RSO signature for gamma scans or survey.	1. Resample due to different weights for on- and off-site lab and counting of samples at off-site lab over a year later, suggesting possible sample substitution; inconsistent results between off-site and on-site lab; and low variability in Bi-214 FSS_SYS data set.		

TU061	2	1. FSS_Bias samples for Bi-214 and K-40 have lower variability than FSS_SYS samples.	1. K-40 FSS_SYS and FSS_Bias have different slopes, FSS_SYS has multiple populations. 2. Form notes, "K-40 FSS: Bimodal distribution indicated."	1	1. Gamma static max is about 1000 cpm lower than gamma scan max.	Form notes, "Biased samples were all taken 'along the trench bottom.' The FSS samples, taken over the entire SU, show a broader range of activity, as expected. K-40 activity in the trench bottom was unusually homogeneous."	1	R. Zahensky	Name not provided	1	1. FSS_SYS Samples collected over two days. K-40 has much higher variability and Cs-137 has a much lower variability for samples collected the second day, suggesting different population. Bi-214 samples collected the first day have a lower mean and lower variability than those collected the second day.	1	No reviewer or report data for gamma statics.	1. Resample due to uncertainty. FSS_SYS samples collected on two days but show significantly different results, suggesting different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is a bit low.		EPA Statistician performed more detailed statistical analysis included separately
TU062	0		1. K-40 FSS_SYS (no bias samples) has slope breaks indicating multiple populations.	1			1	J. Taylor	Name not provided	0		1	No reviewer or report data for gamma statics.			
TU063	0	1. FSS_Bias samples have lower variability than FSS_SYS samples for Ac-228, Bi-214, while the opposite is true for K-40 and Cs-137.	1. Slope breaks in FSS_SYS for Ac-228, Bi-214, K-40, indicating multiple populations.	1	1. Gamma static (4655 - 6034 cpm) and Gamma survey (4700 to 6100 cpm) ranges are unusually consistent		1	J. Taylor	Name not provided			1	1. No RSO signature for gamma scans or survey.	1. Multiple populations do not necessarily indicate falsification.		
TU064	0	1. FSS_SYS samples have lower variability than other sets for Ac-228, Bi-214, K-40, and Cs-137	1. FSS_SYS set has flatter slope for K-40 and Ac-228.	2	1. Gamma static max about 600 cpm lower than gamma survey max.	1. Form notes, "Data is inconsistent in comparison to Ac-228 and K-40. Two final systematic samples (064 and 069) have results at zero based on the offsite data. Two final systematic samples (064 and 069) have low K-40 activity based on the offsite data."	0	Name not provided	C. Fluty					1. DON had one sample recounted as part of a quality review.		
TU065	2	1. FSS_SYS Bi-214 samples have low variability	1. Multiple populations of Ac-228 and Bi-214	1	1. Form notes about gamma statics: "Static survey date and time not provided in SUPR. Gamma static dataset reported low variability and the range of results was inconsistent with the gamma scan dataset." 2. Form notes about gamma scan: "Gamma scan dataset reported a range of results between 3,200 cpm and 5,400 cpm with an investigation level of 9,321 cpm, and was inconsistent with the gamma static dataset."	1. Form notes, "Two samples were sent to the offsite lab for analysis, and one of these samples was sent to two different offsite labs for analysis. The Ac-228 results reported by the onsite lab were not consistent with the results reported by the first offsite lab, but the onsite lab results were consistent with the second offsite lab for Ac 228 and all other nuclides."	1	R. Roberson	Name not provided	1	1. Gamma scan and gamma statics were inconsistent with each other. Gamma statics had low variability.	1	SUPR did not have static survey date and time	1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS.		
TU125	2	1. FSS_SYS and FSS_Bias have low variability for Ac-228 and Bi-214. FSS_SYS have low variability for K-40, but FSS_Bias have higher mean and variability. FSS_Bias have low variability for Cs-137.	1. K-40 FSS_Bias appear to be a different population. There is a slope break (2 populations) in the FSS_SYS for K-40.	5	1. No date or time recorded for the static survey in SUPR. 2. Form notes for gamma scan, "Scan survey performed on 04/09/09 at 11:20 after the first final systematic sample was collected." However, the gamma scan should have been performed first, followed by the gamma statics.	1. RPD 53.28 to 125.37 for Ra-226.	1	R. Zahensky	Name not provided	1	1. Gamma scan conducted after or during collection of FSS_SYS samples.	1	SUPR did not have static survey date and time	1. Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias.		
TU126	2	1. FSS_SYS and FSS_Bias have very low variability for Ac-228 and Bi-214. FSS_SYS has low variability for K-40 and FSS_Bias has very low variability for Cs-137. Mean of K-40 FSS_Bias samples is higher than for other sets.	1. K-40 FSS_SYS and FSS_Bias have different slopes, and slope breaks indicative of multiple populations. Appears to indicate that samples could be from different locations, possibly not associated with TU 126.	4	1. Gamma static (3715-7401 cpm) and gamma scan (3,700 to 7,400 cpm) ranges were unusually consistent (nearly identical). This consistency is suspect.		1	T. Rolfe	Name not provided	1	1. Nearly identical gamma scan and gamma static data ranges. 2. K-40 data appear to indicate different sources for FSS_SYS and FSS_Bias samples.	1	No reviewer or review date for gamma statics.	1. Multiple flags for K-5 test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-212 mean is 7th lowest. Pb-212 is 12th lowest. 2. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-228 and Bi-214 and K-40 FSS_SYS, and the potential that the K-40 sample indicate different sources.		
TU127	2	1. No FSS_Bias samples, even though there were gamma static and gamma scan exceedences.	1. Slope breaks in FSS_SYS for Ac-228, Bi-214, K-40, indicating multiple populations.	2	1. Form notes about gamma statics, "Gamma static counts ranged between 6,758 and 11,311 cpm; four counts exceeded the IL of 9,160 cpm. The range of gamma static counts is consistent with the gamma scan range and the FSS dataset. No reviewer or review data listed." 2. Form notes about gamma scan, "The gamma scan range was reported between 6,250 and 11,800 cpm, which is consistent with the range of gamma static counts and the FSS dataset. No further explanation is given for additional actions taken as a result of exceeding the IL of 9,160 cpm. These results are unusual in that the scan range and the static range are nearly identical."	1. Form notes, "Onsite / offsite data compared satisfactorily within one order of magnitude (a factor of 10)." Language suggests that there could have been large differences.	1	A. Smith	Name not provided	1	1. Unusually consistent gamma scan and gamma static data ranges. 2. Possible factor of 8 or 9 difference between on-site and off-site lab results. 3. No FSS_Bias samples even though there were exceedences in the gamma scan and gamma static data.	1	No reviewer or review date for gamma statics.	1. Resample due to unusually consistent gamma scan and gamma static data ranges, failure to collect bias samples when there were gamma scan and gamma static exceedences, multiple populations in FSS_SYS data for Ac-228, Bi-214, K-40.		
TU128	2	1. Characterization samples appear to be a different population for Bi-214 and K-40 due to very low variability, possibly Ac-228 due to lower mean and data range.	1. FSS_SYS and SYS_1 appear to have different sources due to different slopes, slope breaks, and data ranges for K-40 and Ac-228.	3	1. Form notes about gamma statics, "No date or time recorded for static survey in SUPR. Gamma static dataset consistent with scan data (on the higher end of the scan range) and FSS dataset." 2. Form notes about Gamma scan, "Gamma scan exceeded the scan threshold, but SUPR doesn't reference the count rate exceedances."	1. RPD 25.05 So 114.16	1	R. Zahensky	Name not provided	1	1. Samples appear to be from different sources (data sets have different slopes and slope breaks)	1	SUPR did not have static survey date and time	1. Resample due to different sample sources, based on K-40 and Ac-228 Q-Q plots.		
TU131	2	1. FSS_Bias has low variability for Ac-228, Bi-214, and K-40; K-40 also has lower mean than FSS_SYS. FSS_SYS has low variability for Bi-214. These observations suggest different sources/populations.	1. FSS_SYS and FSS_Bias have different slopes for K-40 and there is a slope break in the FSS_SYS data.	2	1. Form notes about gamma statics, "Static survey date and time not provided in SUPR. Gamma static measurements ranged between 2,452 and 6,581 cpm and are consistent with the reported gamma scan range and FSS dataset." 2. Form notes about gamma scan, "The scan survey was performed on 05/08/09 at 12:25; however, this date may be a reporting error since it is more likely the survey date would have been 05/28/09. Gamma scan range listed as 2,020 to 7,020 cpm – less than the IL of 9,160 cpm. Gamma scan range is consistent with the gamma static measurements range and FSS dataset."	1. Form notes, "Onsite / offsite data compared satisfactorily within one order of magnitude (a factor of 10)." Language suggests that there could have been large differences.	1	R. Zahensky	Name not provided	1	1. Possible failure to collect gamma scan after final excavation and before FSS_SYS samples were collected. 2. Possible factor of 8 or 9 difference between on-site and off-site lab results. 3. Data indicate different sources (populations) for Bi-214, K-40 and Ac-228.	1	1. SUPR did not have static survey date and time. 2. Gamma scan may not have been conducted after final excavation.	1. Resample due to different sources as indicated by the Bi-214, K-40, and Ac-228 data, possible large differences between on- and off-site lab data, and potential failure to collect gamma scan data after final excavation.		EPA Statistician performed more detailed statistical analysis included separately
TU186	2	1. FSS_Bias has low variability for Ac-228 and Bi-214 and characterization samples had low variability for B-214 and K-40.	1. FSS_SYS, FSS_Bias, characterization, and SYS_1 all have different slopes for K-40. There are slope breaks in the FSS_SYS data set indicating multiple populations.	3			0	Name not provided	J. Walther	1	1. Four samples analyzed by on-site lab 8 days after the other 14 samples were analyzed, which could indicate sample substitution. 2. Different slopes for each K-40 data set indicates different populations, suggesting different sample sources.	1	No sampler name.	1. Form notes about sample analysis, "Samples 55-58, 60, 62-64, 66, and 68-72 were analyzed on 11/10/10. Samples 59, 61, 65, and 67 were analyzed on 11/18/2010." This is suspicious - there may have been sample substitution for the 4 samples analyzed more than a week later. 2. Resample due to potential sample substitution of 4 samples in FSS_SYS set and probable different sample source for FSS_SYS, FSS_Bias, SYS_1, and characterization samples based on K-40 Q-Q plots.		EPA Statistician performed more detailed statistical analysis included separately